

REMARKS

Claims 1-55 were originally presented in the subject application. Following a restriction requirement, claims 1-18 and 33-50 were withdrawn. Claim 51 has been amended for clarification. New claims 56-74 have been added to more particularly point out and distinctly claim the subject invention and to secure for the applicant claim coverage which appears to be available under the prior art. Therefore, claims 19-32 and 51-74 are pending in this case.

The addition of new matter has been scrupulously avoided.

Claims 19-32 and 51-55 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Olsen (5,935,106), in view of Olsen (5,695,473), Pastrone, et al. (4,927,411) or Slate, et al. (4,919,596). It is stated in the Office Action that Olsen (5,939,106) discloses an apparatus capable of determining pressure of a sample fluid and having a chamber with an inlet valve, an outlet valve, and an assembly connected to a pressure source which pumps a chamber fluid out of the chamber and wherein the sample fluid is connected to the chamber fluid through the outlet valve. It is further stated that the Olsen apparatus is capable of determining pressure based on the steps defined by the algorithm of CPU (50) as shown in FIG. 1. It is further stated that, “since CPU’s are programmable and can be programmed in basically indefinite (sic) ways, it would not be unreasonable to suggest that the steps or methods disclosed by the applicant are conventional in the art” as evidenced by the teachings of any one of the secondary references. It is further stated that the cited patents demonstrate the conventionality of measuring pressure in a chamber within an apparatus having an inlet valve, an outlet valve and an assembly connected to a pressure source. Finally, it is stated that, for a person of ordinary skill in the art, modifying the apparatus disclosed by Olsen (5,935,106) by altering the programming of the CPU to instruct the apparatus to determine chamber pressure would have been considered obvious in view of the conventionality of these algorithmic enhancements.

Discussion of the Applied References

Olsen (5,935,106) discloses a method and a system for monitoring pressure conditions in a fluid pressure upstream or downstream of an intravenous fluid administration pumping system and for detecting upstream or downstream occlusions. This method and system employs upstream and downstream sensors. For an upstream occlusion, the system looks for a reduction in transient pressure below a baseline pressure. For downstream occlusions, the system looks for an increase in transient maximum pressure or a change in steady state pressure. The system does not measure absolute pressure, column 3, lines 7-11, but rather looks for deviations from expected transient pressures that occur during unoccluded operation. Olsen (5,935,106) contains no disclosure regarding a determination as to when pressure of a chamber fluid and a sample fluid are the same. Likewise, there is no disclosure regarding measurement of chamber pressure in the Olsen (5,935,106) system. Finally, there is no disclosure concerning the measurement of blood pressure or of a sample fluid or of comparing a sample fluid with the pressure of a chamber fluid. The sensors mentioned in Olsen (5,935,1060 are external to the inlet valve 36 and outlet valve 38, as shown in FIG. 1.

As regards Olsen (5,695,473), it is not understood how the apparatus of Olsen (5,935,106) could be modified in accordance therewith since the disclosure of Olsen (5,695,473) is identical.

The Pastrone patent discloses a disposable fluid infusion pumping chamber cassette. It is further disclosed in column 18 at lines 4-14 that a patient's blood pressure can be taken through the described cassette. It should be noted, however, that this is done downstream of the chamber outlet valve while that valve is closed. See column 18, lines 8-14.

The Slate, et al. patent relates generally to an electromechanical system for continuously infusing medication into a patient. While it refers to a pressure diaphragm for enabling pressure sensing of the outlet line in column 5, lines 3-5, it makes no mention of determining the pressure of a sample fluid or of monitoring blood pressure of a patient.

Again, there is no reference to the concept of determining the pressure of a sample fluid by determining chamber pressure when the pressure of the sample fluid equals the chamber pressure.

Patentability of the Claims

Claim 19 calls for a method of determining pressure of a sample fluid which involves the step of determining chamber pressure when the pressure of the sample fluid equals the chamber pressure. Neither the primary reference, Olsen (5,935,106) nor any of the secondary references make reference to apparatus or steps to determine chamber pressure when the pressure of the sample fluid equals the chamber pressure. Accordingly, there is no suggestion coming from any of the references, alone or in combination, that would motivate one skilled in the art to employ the method of Claim 19. While the Office Action states that the Olsen patent (5,935,106) discloses an apparatus “capable” of determining pressure of a sample fluid, that patent contains no teaching as to how such a determination would be made. The suggestion that the CPU (50) shown in FIG. 1 of Olsen (5,935,106) can be programmed to determine chamber pressure seems inappropriate, especially considering that this patent does not disclose any apparatus or steps for measuring chamber pressure. Furthermore, the secondary references likewise do not disclose methods or steps for measuring chamber pressure. Finally, the suggestion to reprogram CPU (50) would amount to hindsight reconstruction of the prior art to arrive at the invention disclosed in the subject application. There is simply no suggestion in any of the references that they can or should be combined to produce the invention of Claim 19.

Claims 20-27 depend from Claim 19 and are patentable for the reasons stated above.

Claim 28 contains additional specific limitations not found in the cited references. For example, Claim 28 specifies that the pressure source comprises a motor which generates a negative pressure in the chamber and pumps the chamber fluid into the chamber, and a spring which generates a positive pressure and pumps the fluid out of the chamber. Since

these limitations are not taught or suggested by the cited references, Claim 28 is believed to be independently allowable.

Likewise, Claim 29 recites the additional specific limitation that the determination of the chamber pressure includes determining the position of the piston. Since this limitation is not taught or suggested by the cited references, Claim 29 is believed to be independently allowable.

Similarly, Claim 30 specifies the use of an optical position sensor which is not taught or suggested by the references, thus making Claim 30 independently allowable.

Claims 31 and 32 depend from Claim 19 and are allowable for the reasons set forth above.

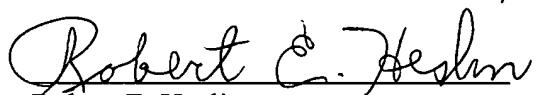
Apparatus Claim 51 has been amended for clarification. It calls for a central chamber with an outlet valve wherein a sample fluid is connected to a chamber fluid in the central chamber through the outlet valve, an assembly moving in and out of the central chamber, a pressure source connected to the assembly wherein the pressure source comprises a motor and a spring, a position sensor connected to the assembly wherein the position sensor determines a position change and a processor connected to the position sensor wherein the processor receives the position change of the assembly and calculates the pressure of the central chamber when the pressure of the sample fluid equals the pressure of the central chamber. Neither the primary Olsen reference nor any of the secondary references, either alone or in combination, teach or suggest an apparatus containing these limitations. For example, there is no teaching or suggestion regarding the use of an assembly moving in and out of the central chamber together with a position sensor connected to the assembly wherein the position sensor determines a position change of the assembly and a processor receives the position change and calculates pressure of the central chamber when the pressure of the sample fluid equals the pressure of the central chamber. Since these claim elements do not appear in any of the cited references, the combination of those references would not result in

Similarly, claim 66 is similar to claim 29 and is believed to be independently allowable for the reasons set forth above. Claim 67 is similar to claim 30 and is believed to be independently allowable for the reasons set forth above regarding claim 30. Finally, claims 70-74 depend from claim 51 and are therefore believed to be allowable for the reasons stated above with regard to claim 51.

Reexamination and reconsideration of this application is earnestly solicited.

If a telephone conference would be of assistance in advancing prosecution of the subject application, applicant's undersigned attorney invites the Examiner to telephone him at the number provided.

Respectfully submitted,



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